NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

LAND RECONSTRUCTION, CURRENTLY MINED LAND

(Acre)
CODE 544

DEFINITION

Restoring currently mined land to an acceptable form and planned use.

PURPOSE

- Prevent negative impacts to soil, water, and air resources in and near mined areas.
- Restore the quality of the soils to their pre-mining level.
- Reduce erosion and sedimentation.
- Maintain or improve the visual quality of the landscape.

CONDITIONS WHERE PRACTICE APPLIES

This standard applies to areas that are or will be undergoing surface mining operations.

It applies to the identification, removal, stockpiling, and replacement of soil materials on currently mined land. This standard applies to nearby areas that can be affected by the mining of various minerals or commodities.

CRITERIA

General Criteria Applicable to All Purposes

Reclamation and operation plans must comply with all local, state, and federal laws and regulations relating to mining and reclamation. These include:

- Surface Mining Control and Reclamation Act of 1977 (SMCRA), 30 U.S.C. 1201 et seq.
- 30 CFR 785.17, 816.22, and part 823.
- Federal Register/Vol. 64, No. 124, Tuesday, June 29, 1999/Notices, pages 34770-34778.
- 30CFR780.15 – Air pollution control plan.
- 30CFR701.5 – Definitions: Fugitive dust.

Dust Control. The generation of particulate matter and fugitive dust shall be controlled during removal and replacement of soil and other earthy materials by controlling vehicular and pedestrian traffic; and, when appropriate, by modifying soil moisture. Temporary vegetation shall be established, as needed, on disturbed soils.

Earthmoving activities shall be restricted or stopped when wind direction and velocity could allow particulate matter and dust to impair visibility on roads downwind from the construction area.

Site preparation. Areas shall be cleared of trees, logs, brush, rubbish, and other undesirable materials. Areas to be preserved, including those containing trees, vegetation, stream corridors, natural springs

or other important features shall be properly identified.

Additional structural measures shall be installed as needed to support the intended use of the site.

Establishment of Vegetation. Plant materials established on the site shall be adapted to the site conditions, and appropriate for the intended use of the site.

Soil amendments and plant nutrients shall be applied to the site based on soil test recommendations to achieve the physical and chemical soil conditions suitable to support plant growth.

Seedbed preparation, seeding rates, dates of planting, and planting methods shall be consistent with the intended use of the site and approved local criteria.

Additional Criteria to Restore the Productivity of Soils to Their Pre-mining Level.

Removal of Material for Soil Reconstruction. A detailed soil survey shall be done on the entire area to be mined. This information will be used to determine the extent and location of prime farmland soils.

All upper soil horizons to be used in reconstructing the soil shall be removed from the immediate area before blasting, mining or any surface disturbance other than removal of woody plants.

If the area is prime farmland and/or soil productivity is consistent with that needed for post-mining use, the A horizon shall be removed and stockpiled separate. The B horizon or part of the C horizon or other underlying layers suitable for root development shall be removed and segregated for use as subsoil. The minimum depth of the soil and the soil material to be reconstructed shall be 48 inches (122 cm) or equal to the depth of the subsurface horizon in the natural soil, whichever is less. If root-inhibiting layers, such as bedrock or a fragipan, underlie the natural soil, the reconstructed depth shall be no less than the rooting depth of the original soil.

For soils that are not prime farmland, the A horizon shall be removed for use as surface soil on disturbed areas. If the A horizon is less than 6 inches (45 cm) thick, material (other than bedrock) immediately below the A horizon shall be removed and used to obtain this thickness. If the total thickness of the available material is less than 6 inches (15 cm), all unconsolidated material shall be used.

Soils identified with high electrical conductivity (EC), calcium carbonate, sodium or other restrictive properties shall be separated and treated if practical.

Removal of Overburden Material for Use as Topsoil. Selected overburden material can be substituted for or added to the material in the A and B horizons. Before this is done, field observations and/or chemical and physical laboratory analyses must be done which demonstrate that the overburden material, or a mixture of overburden and original topsoil, is better suited to restoring the capability and productivity than the original A and B horizon material. Analyses shall include determination of pH value; sulfide content; percentage of organic material; nitrogen, phosphorus, and potassium contents; sodium absorption ratio (SAR); electrical conductivity (EC); texture; and available water capacity. Field-site trials or greenhouse tests shall be conducted if needed to ascertain the feasibility of using overburden material.

If the overburden material is determined to be suitable, it must be removed, segregated and replaced according to the requirements specified in this standard.

Storage of Soil Material. If it is impractical to spread the material immediately after the land is regraded, it must be stockpiled. Stockpiles shall be selectively located and protected against wind and water erosion, unnecessary compaction, and contamination by undesirable materials

Replacement of Soil Material. Before spreading topsoil, the regraded areas must be scarified or otherwise treated to eliminate slippage surfaces and to promote root penetration.

Topsoil shall be spread in a manner that:

1. Insures that the position and thickness of each horizon is equivalent to those in the undisturbed soil.
2. Prevents excess compaction. The bulk density and soil strength of the reconstructed soil when moist must permit the soil to support plant growth at a level equivalent to that of a similar layer in undisturbed soil.

Nutrients and Soil Amendments. After the topsoil has been spread on the disturbed areas, nutrients and soil amendments shall be applied based on a nutrient management plan for the site.

Additional Criteria to Reduce Erosion and Sedimentation

For all post-mining land uses, develop a resource management system that reduces water and/or wind erosion to acceptable levels for the planned use of the site.

The resource management system shall consider buffer practices, such as filter strips, riparian forest buffers, contour buffer strips or similar practices that will reduce sediment delivery off the reclamation site.

Additional Criteria to Maintain or Improve the Visual Quality of the Landscape

The appearance of the reclaimed site shall be in accordance with standards for maintaining and improving the visual quality of the landscape and shall be compatible with the adjacent landscape. Areas of high public visibility or those offering direct or indirect human benefits shall be evaluated and considered in landscape resource management planning and design.

CONSIDERATIONS

Evaluate water and other related resources.

Consider locations for storage of soil material, access roads, and possible permanent impoundments.

Consider measures for placement of spoil, water disposal, replacement of soil material, restoration of soil productivity and revegetation of disturbed areas.

Consider measures to maintain or enhance landscape resources.

Planting reclaimed areas to perennial vegetation to sequester carbon.

The use of organic materials such as manure, compost, mulch, or sewage sludge can contribute to the success of vegetative establishment and the long-term success of the planting. Such materials also can increase the organic matter content of the soil.

A special concern is the potential for uncovering or redistributing toxic materials from earth moving activities.

Consider cultural resources when planning, installation, and maintenance. This practice may adversely affect cultural resources and should comply with 420 GM Part 401 concerning cultural resources.

PLANS AND SPECIFICATIONS

Plans and specifications for reconstructing currently mined land shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

Plans shall include provisions for the disposal of toxic materials that may be uncovered as a result of earth moving and reclamation activities.

A reclamation plan must be developed for each site. The plan must specify the required procedures for conducting reclamation operations.

OPERATION AND MAINTENANCE

An O & M plan shall be prepared that provides specific details concerning maintenance and operation of conservation practices identified in the reclamation plan. The O & M plan shall specify procedures for:

- filling areas where settlement may adversely affect drainage and intended land use
- On sites established to perennial vegetation, promptly repairing and revegetating bare spots and eroded areas, areas of excessive settlement, and other areas on which the initial attempt to establish vegetation was not successful.
- Adding soil amendments to soils that cannot support adequate vegetation or replacing them with suitable soil material
- Maintaining access roads
- Keeping drainage structures and channels clean and functional
- Applying fertilizer and lime
- Controlling weeds
- Using proper grazing practices
- Controlling vehicular traffic

REFERENCES

Soil Survey Division Staff. 1993. Soil Survey Manual. Pp. 90-92. Soil Conservation Service. U. S. Department of Agriculture Handbook 18.

Soil Science of American Proceedings. 1956. Volume 20, Number 20, Pp. 288-292, “Influence of Moisture on Erodibility of Soil by Wind”.